

REMARKS

This is in response to the Office Action dated August 29, 2003.

Applicants have amended the specification to make the corrections at pages 12 and 13 that were identified by the Examiner. Applicants also corrected the first word at page 16 of the application. The Examiner said that page 3, line 1, the word "dire" should be changed to "direct." However, dire is the correct word. In the context of the application the word dire means terrible. At line 1, of page 3 of the specification, applicants are speaking of the terrible consequences of chronic mercury poisoning.

Applicants amended claim 6 to insert the word "to" before burners as requested by the Examiner.

The Examiner rejected claims 1 through 9 under 35 U.S.C. Section 112 saying that the specification teaches that ammonia, urea and carbon monoxide affect the chlorine concentration in the exhaust gases rather than directly oxidizing with mercury. Therefore, applicant has amended claims 1, 3, 4, 5, 6, 7 and 10 to state that the fuel contains both mercury and chlorine and to state that the ammonia is introduced in sufficient amounts to increase concentration of atomic chlorine in the second temperature zone such that the chlorine will bond with mercury present in the flue gas in the second temperature zone. This amendment overcomes the rejection under Section 112.

The Examiner has rejected all the claims under 35 U.S.C. Section 102 as anticipated by U.S. Patent No. 6,146,605 to Spokoyny. That patent discloses a combined SCR, SNCR process in a furnace that burns fossil fuels. At column 6, line 28, and column 7, line 1, the specification teaches that the furnace may burn coal, natural gas or fuel oil. In the disclosed process ammonia

in the form of urea is injected into the furnace above the primary combustion at a temperature of 1600° to 2100°F. See column 7, line 34. A 3% to 10% mixture of ammonia and air is injected into the flue gas immediately prior to the catalyst in the SCR system provided in this furnace. The patent teaches that the temperature of the flue gas is in the could be from 300°F to 1000°F and more preferably is between 450°F and 800°F when it passes through the catalyst. (Col. 8, lines 1-5). There is no teaching in the Spokoyny patent that the fuel contains both mercury and chlorine or another metal and chlorine. However, the Examiner contends that mercury and chlorine are inherently present in flue gas from fossil fuel. The Examiner cites U.S. Patent 6,136,281 to Meischen et al. as teaching that a typical flue gas from coal contains an NO_x, O₂, H₂O, CO₂, CO, SO₂, HCl, Cl₂, H₂S, NH₃, volatile metals, and mercury. But, Spokoyny teaches that natural gas and fuel oil could be used as a fuel. Those fuels contain no mercury or chlorine. There is also no teaching that the injection of ammonia by Spokoyny will remove mercury or other metals from the flue gas. Nevertheless, the Examiner says such removal is inherent in the disclosure of Spokoyny. Applicants disagree.

To establish inherency the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference and that it would be so recognized by persons of ordinary skill." Continental Can Company v. Monsanto Company, 948 F.2d 1264, 1268; 20 USPQ 2d 1746, 1749 (Fed. Cir. 1991). Inherency, however, may not be established by probability or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Id. at 1749. Atlas Powder v. IRECO, Inc., 51 USPQ 2d 1943, 1950-1951 (Fed. Cir. 1999).

Applicants' disclosure demonstrates that removal of the mercury and other metals will depend not only upon the injection of ammonia, but also upon the temperature range in which the injection occurs. As taught at page 9 of the present application, ammonia in limited amounts can increase the concentration of chlorine in flue gas. The oxidation temperature of mercury is 1220°F to 900°F. Applicants realized and teach that HgCl_2 will be attracted to particulates in flue gas and those compounds can be removed with the particulates in a scrubber or bag house. (Specification, p. 15). Consequently, the only way in which injection of ammonia can result in mercury removal is if the ammonia is present in the temperature range where mercury oxidizes and can form HgCl_2 , namely 1220°F to 900°F. Spokoyny does not teach or suggest injection of ammonia in this temperature range. Instead, he injects ammonia in the SNCR system where the temperature is 1600°F to 2100°F and in the SCR system where the temperature preferably is between 450°F and 800°F. Certainly, it is possible that ammonia injected at either location will be present in the flue gas at 1200°F to 900°F. It is also possible that the ammonia which is present in that temperature zone will be sufficient to increase the concentration of atomic chlorine and result in formation of HgCl_2 . But, it is equally possible that no ammonia will be present in the flue gas at a temperature of 1200°F to 900°F in Spokoyny's furnace. Therefore, HgCl_2 will not necessarily be formed in Spokoyny's furnace and mercury or other metals will not necessarily be removed. Moreover, even if ammonia was present in this temperature zone and even if HgCl_2 was formed, those events would not have been recognized by those skilled in the art. Those who reported the higher mercury removal rate of Salem Harbor Unit 3, described at page 15 of the applicants' specification, did not recognize that HgCl_2 may have been formed as a result of the presence of ammonia when the flue gas was between 900° and 1350°. For all these

reasons it cannot be said that removal of mercury or other metals is inherent in Spokoyny's disclosure. Therefore, the claims are not anticipated by this reference.

Applicants' claimed method also would not have been obvious to those skilled in the art. None of the references teach or suggest the temperature range at which ammonia must be present or at which flue gas temperatures the ammonia should be injected. Only through the use of impermissible hindsight could one read Spokoyny and the other cited references to select a fuel containing mercury or other metals and chlorine and to inject ammonia into the flue gas in a temperature zone of 900°F to 1350°F. But, this is not the way in which obviousness is determined. Instead, the Examiner must view the art at the time the invention was made without benefit of what applicants teach in their specification. See Orthopedic Equipment Co., Inc. et al. v. United States, 702 F.2d 1005, 1012; 217 USPQ 193, 199 (Fed. Cir., 1983). Consequently, all the pending claims are patentable over the cited references.

Claims 2 through 6 require the addition of carbon monoxide to the flue gas in the second temperature zone. This is not taught or suggested by Spokoyny or any of the other cited references. Indeed, the Examiner has cited no prior art reference that teaches one to add carbon monoxide to flue gas. Consequently, claims 2 through 6 are independently patentable.

Applicant has added new claim 16 which depends from claim 1 and narrows the temperature zone to a range of greater than 1000°F and not greater than 1350°F. This range is not taught or suggested by Spokoyny. Therefore, new claim 16 is patentable over the cited references.

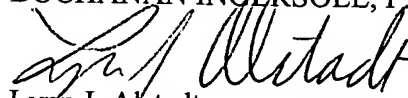
Appl. No. 10/072,341
Amendment dated November 26, 2003
Reply to Office Action of August 29, 2003

For the foregoing reasons, applicants submit that the claims as amended are patentable.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.



Lynn J. Alstadt

Registration No. 29,362

BUCHANAN INGERSOLL, P.C.

One Oxford Centre

301 Grant Street

Pittsburgh, Pennsylvania 15219

Attorney for Applicant

(412) 562-1632